CLAIMS

1. A refining surface for a refiner intended for defibrating lignocellulose-containing material, the refiner comprising at least two refining surfaces (1, 2) arranged coaxially relative to each other, at least one of which refining surfaces (1, 2) is arranged to rotate around a shaft (4), and between which refining surfaces (1, 2) the material to be defibrated is fed, and which refining surface (1, 2) comprises first bars (12) extending from the inner circumference of the refining surface (1, 2) to the outer circumference of the refining surface (1, 2) and between them first grooves (13), and the upper surfaces (18) of which first bars (12) further comprise second grooves (15) connecting said first grooves (13), and between which second grooves (15) there are second bars (14),

characterized in that

the second bars (14) are narrower than the first bars (12).

2. A refining surface as claimed in claim 1, **characterized** in that the average width of the first bar (12) is 2.5- to 40-fold in respect of the combined, average width of the second bar (14) and the second groove (15).

3. A refining surface as claimed in claim 1 or 2, **characterized** in that the total area of the refining zones of the refining surface (1, 2) formed of the second bars (14) and the second grooves (15) is 60 to 90% of the total area of the refining surface (1, 2).

4. A refining surface as claimed in claim 3, **characterized** in that the total area of the refining zones of the refining surface (1, 2) formed of the second bars (14) and the second grooves (15) is 70 to 80% of the total area of the refining surface (1, 2).

5. A refining surface as claimed in any one of the preceding claims, **characterized** in that the width of the first bars (12) is 15 to 80 mm, the width of the first grooves (13) 5 to 40 mm and the depth of the first grooves (13) 10 to 40 mm.

6. A refining surface as claimed in any one of the preceding claims, **characterized** in that the first bars (12) and/or the first grooves (13) have a varying width and/or the first grooves (13) have a varying depth in the direction of travel of said bars (12) or grooves (13).

7. A refining surface as claimed in any one of the preceding claims, **characterized** in that the first grooves (13) are pumping on the feed

side of the fibrous material to be refined and retentive on the discharge side of the refined material.

8. A refining surface as claimed in any one of the preceding claims, **characterized** in that the width of the second bars (14) is 1 to 3 mm, the width of the second grooves (15) 1 to 3 mm and the depth of the second grooves (15) 3 to 5 mm.

9. A refining surface as claimed in any one of the preceding claims, **characterized** in that the second bars (14) and/or the second grooves (15) have a varying width and/or the second grooves (15) have a varying depth in the direction of travel of said bars (14) or grooves (15).

10. A refining surface as claimed in any one of the preceding claims, **characterized** in that said second bars (14) and second grooves (15) are arranged on the upper surface of the first bars (12) so that they form an angle of 5 to 30° to the radius of the refining surface (1, 2).

11. A refining surface as claimed in any one of the preceding claims, **characterized** in that the number of the second bars (14) of the refining surface zone (16) closest to the feed of the material to be refined is smaller than the number of the second bars (14) closest to the discharge of the refined material, and that the width of the second grooves (15) between the second bars (14) of the zone of the refining surface (1, 2) closest to the feed of the material to be refined is approximately in accordance with the upper limit of the variation range of the width of the grooves (15), and that the width of the second grooves (15) between the second bars (14) closest to the discharge of the refined material is approximately in accordance with the lower limit of the variation range of the width of the grooves (15).

12. A refining surface as claimed in claim 11, **characterized** in that in the radial direction of the refining surface (1, 2), the depth of the second groove (15) in each refining surface zone (16) of the refining surface (1, 2) is greater at the beginning of the zone (16) than at the end of the zone (16).

13. A refining surface as claimed in claim 12, **characterized** in that on the bottom of the second groove (15) there is a step at the beginning of each zone (16) for hindering the material to be refined from flowing backwards.

14. A refining surface as claimed in any one of the preceding claims, **characterized** in that the refining surface (1) is the refining surface (1) of a rotor (3) of the refiner, being provided with at least one foil (17), which,

when the rotor (3) rotates in the pumping direction, is arranged to produce a lifting force to intensify the mixing of fibres and water, and which foil (17), when the rotor (3) rotates in the non-pumping direction, is arranged to cause a push force to intensify the pumping effect and the passing through of the fibrous material.

15. A refining surface as claimed in claim 14, **characterized** in that the foil (17) is arranged on the bottom of the first groove (13).

16. A refining surface as claimed in claim 14 or 15, **characterized** in that the length of the foil (17) is 30 to 80 mm, preferably 50 to 60mm, in the transverse direction of the first groove (13).

17. A refining surface as claimed in any one of claims 1 to 16, **characterized** in that the first bars (12) extend substantially in the linearly outward direction over the refining surface (1, 2).

18. A refining surface as claimed in any one of claims 1 to 17, **characterized** in that the first bars (12) extend in an arc-shaped manner outward over the refining surface (1, 2).

19. A blade segment for a refiner intended for defibrating lignocellulose-containing material, the refiner comprising at least two refining surfaces (1, 2) arranged coaxially relative to each other, at least one of which refining surfaces (1, 2) is arranged to rotate around a shaft (4), and between which refining surfaces (1, 2) the material to be defibrated is fed, and which blade segment can be arranged to form at least a part of at least one refining surface (1, 2), and which blade segment comprises first bars (12) extending from the inner circumference of the refining surface (1, 2) to the outer circumference of the refining surface (1, 2) and between them first grooves (13), and the upper surfaces (18) of which first bars (12) further comprise second grooves (15) connecting said first grooves (13), and between which second grooves (15) there are second bars (14),

characterized in that

the second bars (14) are narrower than the first bars (12).

20. A blade segment as claimed in claim 19, **characterized** in that the average width of the first bar (12) is 2.5- to 40-fold in respect of the combined, average width of the second bar (14) and the second groove (15).

21. A blade segment as claimed in claim 19 or 20, **characterized** in that the total area of the refining zones of the refining surface (1, 2)

formed of the second bars (14) and the second grooves (15) is 60 to 90% of the total area of the refining surface (1, 2).

22. A blade segment as claimed in claim 21, **characterized** in that the total area of the refining zones of the refining surface (1, 2) formed of the second bars (14) and the second grooves (15) is 70 to 80% of the total area of the refining surface (1, 2).

23. A blade segment as claimed in any one of claims 19 to 22, **characterized** in that the width of the first bars (12) is 15 to 80 mm, the width of the first grooves (13) 5 to 40 mm and the depth of the first grooves (13) 10 to 40 mm.

24. A blade segment as claimed in any one of claims 19 to 23, **characterized** in that the first bars (12) and/or the first grooves (13) have a varying width and/or the first grooves (13) have a varying depth in the direction of travel of said bars (12) or grooves (13).

25. A blade segment as claimed in any one of claims 19 to 24, **characterized** in that the first grooves (13) are pumping on the feed side of the fibrous material to be refined and retentive on the discharge side of the refined material.

26. A blade segment as claimed in any one of claims 19 to 25, **characterized** in that the width of the second bars (14) is 1 to 3 mm, the width of the second grooves (15) 1 to 3 mm and the depth of the second grooves (15) 3 to 5 mm.

27. A blade segment as claimed in any one of claims 19 to 26, **characterized** in that the second bars (14) and/or the second grooves (15) have a varying width and/or the second grooves (15) have a varying depth in the direction of travel of said bars (14) or grooves (15).

28. A blade segment as claimed in any one of claims 19 to 27, **characterized** in that said second bars (14) and second grooves (15) are arranged on the upper surface of the first bars (12) so that they form an angle of about 5 to 30° to the radius of the refining surface (1, 2).